

New scale insects recorded for the Comoros and Seychelles Islands

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Abstract: First reports of 5 species of scale insects are given for the Comoros (*Prococcus acutissimus*, *Pulvinaria psidii*, *Paracoccus burnerae*, *Planococcus minor*, *Unaspis citri*.) and 8 species for the Seychelles (*Protopulvinaria pyrifomis*, *Nipaecoccus viridis*, *Phenacoccus madeirensis*, *Phenacoccus parvus*, *Pseudococcus jackbeardsleyi*, *Saccharicoccus sacchari*, *Conchaspis angraeci*, *Aulacaspis tubercularis*).

Key words: Comoros, Seychelles, Coccidae, Diaspididae, Pseudococcidae, first report.

Introduction

An inventory has been carried out by CIRAD in the Comoros and the Seychelles within the framework of the PRPV (Programme Régional de Protection des Végétaux). For this survey, missions were carried out in different islands of both countries during which scale insects attacking various crops were collected. The collected samples included some species already recorded in previous studies but also highlighted the presence of 5 species newly recorded for the Comoros (Table 1) and of 8 species newly recorded for the Seychelles (Table 2). The majority of these species are cosmopolitan and polyphagous.

Eight of the 53 species of Coccoidea already known to be present in the Comoros (Matile-Ferrero, 1978; Ben-Dov *et al.*, 2006) were found during this study: *Ferrisia virgata* (Cockerell), *Planococcus lilacinus* (Cockerell), *Pseudococcus longispinus* (Targioni Tozzeti), *Chrysomphalus aonidum* (Linnaeus), *Hemiberlesia palmarum* (Cockerell), *Lepidosaphes beckii* (Newman), *Pseudaonidia trilobitiformis* (Green) and *Pseudaulacaspis pentagona* (Targioni Tozzeti) (Table 1).

In the Seychelles, 54 species had already been recorded (Ben-Dov *et al.*, 2006) and 9 of them were found during our study: *Icerya seychellarum* (Westwood), *Coccus hesperidum* (Linnaeus), *Coccus viridis* (Green), *Milviscutulus mangiferae* (Green), *Pulvinaria psidii* Maskell, *Saissetia coffeae* (Walker), *Dysmicoccus brevipes* (Cockerell), *Maconellicoccus hirsutus* (Green) and *Planococcus lilacinus* (Cockerell) (Table2).

1. Species newly recorded for the Comoros

Coccidae

Prococcus acutissimus (Green, 1896)

Collected by A. Barbet and M. Attié, 09/01/2004 in Sambia on *Capsicum*. This species was described as *Lecanium acutissimum* by Green in 1896 from Sri Lanka (Paradeniya) on *Areca catechu*.

Distribution: Oriental Asia, Japan, Pacific Islands, East Africa (Kenya), Mauritius, USA (Florida and Texas).

Hosts: this polyphagous species can develop on host-plants belonging to some thirty families.

***Pulvinaria psidii* Maskell, 1893**

Collected by A. Barbet and M. Attié, 08/26/2004 in Pomoni on *Capsicum*. This species was originally described from Hawaii on *Psidium* sp.

Distribution: very wide pantropical distribution. In the Indian Ocean, it has already been recorded in Madagascar, Mauritius, La Réunion and the Seychelles.

Hosts: extremely polyphagous, with host-plants belonging to more than sixty botanical families. It is considered to be an important pest on *Mangifera indica* in Egypt (Nada *et al.*, 1990).

Pseudococcidae

***Planococcus minor* (Maskell, 1897)**

Collected by A. Barbet and M. Attié, 26 and 08/27/2004, Hotel Al amal on *Cajanus cajan*; 08/27/2004 in Koki on *Coffea*. This species was first described as *Dactylopius calceolariae minor* in 1897 on 'onion grass' in Mauritius. It is very close to *Planococcus citri* with which it has often been mistaken.

Distribution: this is a cosmopolitan species with a tropical distribution especially in the Eastern, Neotropical and Australasian areas. It is recorded from Madagascar and the Seychelles (Ben-Dov, 1994).

Hosts: Extremely polyphagous, it can develop on plants belonging to 69 families. It is common on very many plants of economic importance in tropical areas, especially on cocoa.

***Paracoccus burnerae* (Brain, 1915)**

Collected by A. Barbet and M. Attié, 08/26/2004 in Pomoni on *Cajanus cajan* and 08/27/2004 in Ongoni on *Ipomoea batatas*.

This species was originally described from South Africa: Pretoria on *Passiflora edulis*, *Nerium oleander*, *Sida rhombifolia* and *S. longipes*; Lyndenbur on *Viburnum* sp. and Bloemfontein on *Gleditschia* sp.

Distribution: widespread in sub-Saharan Africa. It is also recorded in India (Ben-Dov, 1994).

Hosts: this polyphagous species is found on members of a series of botanical families including Musaceae, Rubiaceae and Rutaceae. It is considered to be one of the significant pseudococcines in Citrus orchards in South Africa (Hattingh, 1993).

Diaspididae

***Unaspis citri* (Comstock, 1881)**

Collected by A. Barbet and M. Attié, 08/27/2004 in Koki on *Citrus* sp.

This species was first described as *Chionaspis citri* in the United States of America (Louisiana) on *Citrus* sp.

Distribution: very wide pantropical distribution. It is recorded from Madagascar and Mauritius.

Hosts: host-plants include the Annonaceae, Arecaceae, Bromeliaceae, Celastraceae, Musaceae, Myrtaceae, Oleaceae, Rosaceae and especially Rutaceae. This species is of economic importance as a pest of Citrus.

2. Species newly recorded for the Seychelles

Coccidae

***Protopulvinaria pyriformis* (Cockerell, 1894)**

Collected by A. Barbet and M. Attié, 09/21/2004 in Grand' Anse (PGRDC) on *Persea americana*.

This species was originally described from Trinidad, St. Anns in 1894 on *Psidium guajava*. Distribution: it has a subtropical distribution especially. Recorded in the West Indies, the Comoros and Mauritius. In France it has been recorded on the Mediterranean coast. Hosts: this polyphagous species is recorded on plants belonging to some thirty botanical families including Anacardiaceae, Caricaceae, Lauraceae, Myrtaceae and Rutaceae. It is a pest of economic importance on avocado, guava and many ornamental plants in tropical areas.

Pseudococcidae

***Nipaecoccus viridis* (Newstead, 1894)**

Collected by A. Barbet, 12/05/2003 in Grand' Anse Nursery on *Persea americana*.

This species was described from India (Madras) on *Hygrophila spinosa*.

Distribution: widespread through the tropical and subtropical areas. In the Western Indian Ocean, it is present in Kenya, Madagascar and the Comoros.

Hosts: host-plants belong to at least 46 botanical families. This species may be of economic importance on some of its host-plants.

***Phenacoccus madeirensis* Green, 1923**

Collected by A. Barbet, 12/05/2003 in Grand' Anse Billy Ragain on *Capsicum frutescens*.

This species was first described from Madeira (Funchal) on an unidentified plant.

Distribution: widespread in Africa and in the Neotropical and Nearctic areas.

Hosts: this very polyphagous species is able to develop on more than fifty plant families.

***Phenacoccus parvus* Morrison, 1924**

Collected by A. Barbet and M. Attié, on *Lycopersicon esculentum*, on 09/23/2004 with Mr. Bon Lam and 09/27/2004 in My Confiance Mellie.

This species was originally described from the Galapagos Islands on an unidentified host-plant.

Distribution: it presents a Neotropical distribution but is also recorded in Africa and the Maldives Islands.

Hosts: the host-plants of this species belong to some thirty plant families including the Cucurbitaceae, Graminae, Piperaceae and Solanaceae.

***Pseudococcus jackbeardsleyi* Gimpel & Miller, 1996**

Collected by A. Barbet and M. Attié, 12/05/2003 in Grand' Anse Nursery on *Persea americana*, on 09/20/2004 in Anse Boileau (VERS) on *Lycopersicon esculentum*, on 09/22/2004 in Anse Kerlan J. Capricieuse on *L. esculentum* and on 09/22/2004 in Anse Kerlan Chicken Farmer Mr. Morel on *Solanum melongena*.

This species was described from Mexico (Chiapas) on fruit of *Musa* sp.

Distribution: it is present especially in the West Indies but also in South-East Asia, the Pacific and the South of the USA. We intercepted it in France in 2001 on *Gardenia* spp. imported from Ivory Coast (Germain, 2001).

Hosts: this species may develop on plants belonging to some fifty botanical families. It is commonly found on crops (banana, tomato, potato) or ornamentals (hibiscus).

***Saccharicoccus sacchari* (Cockerell, 1895)**

Collected by A. Barbet and M. Attié, 09/29/2004 in Misère II on *Momordica* sp.

This species was originally described from Trinidad, St Ann's on *Saccharum officinarum* (sugarcane).

Distribution: large pantropical distribution. In the Indian Ocean, it is present in Madagascar, Rodrigues Island and La Réunion.

Hosts: on Graminaceae. In addition to sugarcane, it may also be found on *Oryza sativa* and *Sorghum vulgare*.

Conchaspidae

***Conchaspis angraeci* Cockerell, 1893**

Collected by G. Wuster, 10/02/2005 in Mahé, Jardin du Roi on *Vanilla* sp.

Description: described from Jamaica on *Angraecum eburneum*.

Economic importance: mentioned as a pest of vanilla in La Réunion.

Distribution: cosmopolite, especially Neotropical and Afrotropical distribution.

Hosts: the host-plants of this species belong to some twenty six plant families among which Orchidaceae.

Diaspididae

***Aulacaspis tubercularis* Newstead, 1906**

Collected by A. Barbet, 12/04/2003 in Grand' Anse Nursery on mango (*Mangifera indica*).

This species was described from Indonesia (Java) in 1906 on *Cinnamomum zeylanicum*.

Distribution: cosmopolitan species present in various tropical and subtropical areas. It is recorded in Kenya, Madagascar, Mauritius and La Réunion.

Hosts: Aceraceae (*Acer kawakamii*), Anacardiaceae (*Mangifera indica*), Arecaceae (*Cocos nucifera*) Iridaceae (*Dietes prolongata*), Lauraceae, Pittosporaceae (*Pittosporum glabratum*), Rutaceae (*Citrus* sp.), Sapindaceae (*Dimocarpus longan*), Zingiberaceae (*Zingiber officinale*). It is recorded as a pest of mango trees in South Africa (Munting, 1977), where a biological control programme was implemented against it (Daneel & Dreyer, 1998), and in La Réunion (Quilici *et al.*, 2003).

Table 1. Scales species found in the Comoros (*: first report of the species for the archipelago).

MARGARODIDAE

| | | |
|---------------|---------------------|------------------|
| <i>Icerya</i> | <i>seychellarum</i> | (Westwood, 1855) |
|---------------|---------------------|------------------|

ORTHEZIIDAE

| | | |
|-------------------------|--------------------|------------------------|
| <i>Insignorthezia</i> | <i>insignis</i> | (Browne, 1877) |
| <i>Newsteadia</i> | <i>multispina</i> | Miller & Kozár, 2002 |
| <i>Ortheziolacoccus</i> | <i>benedictyae</i> | (Kozár & Miller, 2000) |

COCCIDAE

| | | |
|------------------------|---------------------|----------------------|
| <i>Ceroplastes</i> | <i>brevicauda</i> | Hall, 1931 |
| <i>Ceroplastes</i> | <i>eugeniae</i> | Hall, 1931 |
| <i>Ceroplastes</i> | <i>floridensis</i> | Comstock, 1881 |
| <i>Coccus</i> | <i>viridis</i> | (Green, 1889) |
| <i>Eucalymnatus</i> | <i>tessellatus</i> | (Signoret, 1873) |
| <i>Kilifia</i> | <i>deltoides</i> | De Lotto, 1965 |
| <i>Mametia</i> | <i>louisiae</i> | Matile-Ferrero, 1978 |
| <i>Milviscutulus</i> | <i>mangiferae</i> | (Green, 1889) |
| <i>Parasaissetia</i> | <i>nigra</i> | (Nietner, 1861) |
| <i>Parasaissetia</i> | <i>tsaratananae</i> | (Mamet, 1951) |
| * <i>Prococcus</i> | <i>acutissimus</i> | (Green, 1896) |
| <i>Protopulvinaria</i> | <i>pyriformis</i> | (Cockerell, 1894) |
| * <i>Pulvinaria</i> | <i>psidii</i> | Maskell, 1893 |
| <i>Saissetia</i> | <i>oleae</i> | (Olivier, 1791) |
| <i>Vitrococcus</i> | <i>conchiformis</i> | Newstead, 1910 |

ASTEROLECANIIDAE

| | | |
|--------------------|------------------|-------------------|
| <i>Russulaspis</i> | <i>pustulans</i> | (Cockerell, 1892) |
|--------------------|------------------|-------------------|

PSEUDOCOCCIDAE

| | | |
|----------------------|--------------------|---------------------|
| <i>Antonina</i> | <i>graminis</i> | (Maskell, 1897) |
| <i>Ferrisia</i> | <i>virgata</i> | (Cockerell, 1893) |
| <i>Nipaecoccus</i> | <i>viridis</i> | (Newstead, 1894) |
| * <i>Paracoccus</i> | <i>burnerae</i> | (Brain, 1915) |
| <i>Paraputo</i> | <i>comorensis</i> | Mamet, 1960 |
| <i>Planococcus</i> | <i>citri</i> | (Risso, 1813) |
| <i>Planococcus</i> | <i>lilacinus</i> | (Cockerell, 1905) |
| * <i>Planococcus</i> | <i>minor</i> | (Maskell, 1897) |
| <i>Pseudococcus</i> | <i>longispinus</i> | (Targ. Tozz., 1867) |

CONCHASPIDIDAE

| | | |
|-------------------|-----------------|-----------------|
| <i>Conchaspis</i> | <i>angraeci</i> | Cockerell, 1893 |
|-------------------|-----------------|-----------------|

DIASPIDIDAE

| | | |
|-------------------------|-------------------------|----------------------------|
| <i>Abgrallaspis</i> | <i>cyanophylli</i> | (Signoret, 1869) |
| <i>Africonidia</i> | <i>africana</i> | (Newstead, 1913) |
| <i>Aonidiella</i> | <i>orientalis</i> | (Newstead, 1894) |
| <i>Aspidiella</i> | <i>sacchari</i> | (Cockerell, 1893) |
| <i>Aspidiotus</i> | <i>comorensis</i> | Mamet, 1960 |
| <i>Chrysomphalus</i> | <i>aonidium</i> | (Linnaeus, 1758) |
| <i>Chrysomphalus</i> | <i>dictyospermi</i> | (Morgan, 1889) |
| <i>Hemiberlesia</i> | <i>lataniae</i> | (Signoret, 1869) |
| <i>Hemiberlesia</i> | <i>palmae</i> | (Cockerell, 1892) |
| <i>Lepidosaphes</i> | <i>beckii</i> | (Newman, 1869) |
| <i>Lepidosaphes</i> | <i>europae</i> | Mamet, 1956 |
| <i>Lepidosaphes</i> | <i>morafenobensis</i> | Mamet, 1959 |
| <i>Lopholeucapis</i> | <i>cockerelli</i> | (Grandprè & Charmoy, 1899) |
| <i>Morganella</i> | <i>longispina</i> | (Morgan, 1889) |
| <i>Mycetaspis</i> | <i>personata</i> | (Comstock, 1883) |
| <i>Oceanaspidiotus</i> | <i>spinosus</i> | (Comstock, 1883) |
| <i>Paraselenaspidus</i> | <i>madagascariensis</i> | (Mamet, 1954) |
| <i>Parlatoria</i> | <i>crotonis</i> | Douglas, 1887 |
| <i>Parlatoria</i> | <i>crypta</i> | McKenzie, 1943 |
| <i>Pinnaspis</i> | <i>buxi</i> | (Stopped, 1851) |
| <i>Pinnaspis</i> | <i>strachani</i> | (Cooley, 1898) |
| <i>Pseudaonidia</i> | <i>trilobitiformis</i> | (Green, 1896) |
| <i>Pseudaulacaspis</i> | <i>cockerelli</i> | (Cooley, 1897) |
| <i>Pseudaulacaspis</i> | <i>pentagona</i> | (Targioni Tozzetti, 1886) |
| <i>Pseudaulacaspis</i> | <i>subcorticalis</i> | (Green, 1905) |
| <i>Rutherfordia</i> | <i>major</i> | (Cockerell, 1894) |
| <i>Selenaspidus</i> | <i>articulatus</i> | (Morgan, 1889) |
| * <i>Unaspis</i> | <i>citri</i> | (Comstock, 1881) |

Table 2. Scales species found in the Seychelles (*: first report of the species for the archipelago).

MARGARODIDAE

| | | |
|---------------|---------------------|------------------|
| <i>Icerya</i> | <i>seychellarum</i> | (Westwood, 1855) |
|---------------|---------------------|------------------|

COCCIDAE

| | | |
|--------------------------|--------------------|-------------------|
| <i>Ceroplastes</i> | <i>floridensis</i> | Comstock, 1881 |
| <i>Ceroplastes</i> | <i>rubens</i> | Maskell, 1893 |
| <i>Ceroplastes</i> | <i>rusci</i> | (Linnaeus, 1758) |
| <i>Coccus</i> | <i>hesperidum</i> | Linnaeus, 1758 |
| <i>Coccus</i> | <i>longulus</i> | (Douglas, 1887) |
| <i>Coccus</i> | <i>viridis</i> | (Green, 1889) |
| <i>Eucalymnatus</i> | <i>tessellatus</i> | (Signoret, 1873) |
| <i>Milviscutulus</i> | <i>mangiferae</i> | (Green, 1889) |
| <i>Parasaissetia</i> | <i>nigra</i> | (Nietner, 1861) |
| * <i>Protopulvinaria</i> | <i>pyriformis</i> | (Cockerell, 1894) |
| <i>Pulvinaria</i> | <i>floccifera</i> | (Westwood, 1870) |
| <i>Pulvinaria</i> | <i>grabhami</i> | Cockerell, 1903 |
| <i>Pulvinaria</i> | <i>psidii</i> | Maskell, 1893 |
| <i>Saissetia</i> | <i>coffae</i> | (Walker, 1852) |
| <i>Saissetia</i> | <i>oleae</i> | (Olivier, 1791) |
| <i>Vinsonia</i> | <i>stellifera</i> | (Westwood, 1871) |

PSEUDOCOCCIDAE

| | | |
|-------------------------|----------------------|-----------------------|
| <i>Dysmicoccus</i> | <i>brevipes</i> | (Cockerell, 1893) |
| <i>Ferrisia</i> | <i>virgata</i> | (Cockerell, 1893) |
| <i>Maconellicoccus</i> | <i>hirsutus</i> | (Green, 1908) |
| * <i>Nipaecoccus</i> | <i>viridis</i> | (Newstead, 1894) |
| * <i>Phenacoccus</i> | <i>madeirensis</i> | Green, 1923 |
| * <i>Phenacoccus</i> | <i>parvus</i> | Morrison, 1924 |
| <i>Planococcus</i> | <i>lilacinus</i> | (Cockerell, 1905) |
| * <i>Pseudococcus</i> | <i>jackbeardleyi</i> | Gimpel & Miller, 1996 |
| <i>Ripersiella</i> | <i>seychelliella</i> | Konczné & Kozár, 2004 |
| * <i>Saccharicoccus</i> | <i>sacchari</i> | (Cockerell, 1895) |

CONCHASPIDIDAE

| | | |
|---------------------|-----------------|-----------------|
| * <i>Conchaspis</i> | <i>angraeci</i> | Cockerell, 1893 |
|---------------------|-----------------|-----------------|

DIASPIDIDAE

| | | |
|-----------------------|---------------------|------------------------|
| <i>Abgrallaspis</i> | <i>cyanophylli</i> | (Signoret, 1869) |
| <i>Aonidia</i> | <i>obtusa</i> | Green & Laing, 1921 |
| <i>Aulacaspis</i> | <i>tegalensis</i> | (Zehntner, 1898) |
| * <i>Aulacaspis</i> | <i>tubercularis</i> | Newstead, 1906 |
| <i>Chrysomphalus</i> | <i>ansei</i> | (Green, 1916) |
| <i>Chrysomphalus</i> | <i>aonidium</i> | (Linnaeus, 1758) |
| <i>Chrysomphalus</i> | <i>dictyospermi</i> | (Morgan, 1889) |
| <i>Chrysomphalus</i> | <i>pinnulifer</i> | (Maskell, 1891) |
| <i>Diaspis</i> | <i>bromeliae</i> | (Kerner, 1778) |
| <i>Duplaspidiotus</i> | <i>aldabracus</i> | (Green & Laing, 1921)? |
| <i>Duplaspidiotus</i> | <i>claviger</i> | (Cockerell, 1901) |
| <i>Gymnaspis</i> | <i>grown</i> | Green, 1916 |
| <i>Hemiberlesia</i> | <i>lataniae</i> | (Signoret, 1869) |
| <i>Hemiberlesia</i> | <i>palmae</i> | (Cockerell, 1892) |
| <i>Hemiberlesia</i> | <i>rapax</i> | (Comstock, 1881) |

| | | |
|------------------------|------------------------|----------------------------|
| <i>Ischnaspis</i> | <i>longirostris</i> | (Signoret, 1882) |
| <i>Lepidosaphes</i> | <i>beckii</i> | (Newman, 1869) |
| <i>Lepidosaphes</i> | <i>duponti</i> | Green, 1916 |
| <i>Lepidosaphes</i> | <i>ocellata</i> | (Green, 1907) |
| <i>Lepidosaphes</i> | <i>tokionis</i> | (Kuwana, 1902) |
| <i>Lopholeucaspis</i> | <i>cockerelli</i> | (Grandpré & Charmoy, 1899) |
| <i>Melanaspis</i> | <i>bromelinae</i> | (Leonardi, 1899) |
| <i>Melanaspis</i> | <i>smilacis</i> | (Comstock, 1883) |
| <i>Parlatoria</i> | <i>pergandii</i> | Comstock, 1881 |
| <i>Pinnaspis</i> | <i>aspidistrae</i> | (Signoret, 1869) |
| <i>Pinnaspis</i> | <i>buxi</i> | (Stopped, 1851) |
| <i>Pinnaspis</i> | <i>strachani</i> | (Cooley, 1898) |
| <i>Pseudaonidia</i> | <i>trilobitiformis</i> | (Green, 1896) |
| <i>Pseudaulacaspis</i> | <i>cockerelli</i> | (Cooley, 1897) |
| <i>Pseudaulacaspis</i> | <i>gynandropsidis</i> | (Green, 1922) |
| <i>Pseudaulacaspis</i> | <i>pentagona</i> | (Targioni Tozzeti, 1886) |
| <i>Pseudaulacaspis</i> | <i>subcorticalis</i> | (Green, 1905) |
| <i>Rutherfordia</i> | <i>major</i> | (Cockerell, 1894) |

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